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Via Fax and Mail

Anthony Cinque, Case Manager  
Bureau of Federal Case Management  
New Jersey Department of Environmental Protection  
401 East State Street  
P. O. Box 028  
Trenton, NJ 08625

**RE:** L.E. Carpenter Superfund Site, Wharton, New Jersey. Review and comment on the reports entitled *Nature and Extent of Lead in Soils*, and the *Free Product Remedial Strategy*, dated March, 2002

Dear Mr Cinque:

The U.S. Environmental Protection Agency (EPA) has completed its review and comment on the *Nature and Extent of Lead in Soils Report*, and the *Free Product Remedial Strategy Report*, dated March, 2002, and provides the following comments on the attachment.

If you have any questions or comments on the above, please contact me at (212) 637-4411. Thank you for the opportunity to review the above reports.

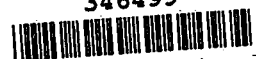
Yours truly,

Stephen Cipot, Remedial Project Manager  
Southern New Jersey Remediation Section

Enclosure

bcc: Andy Crossland, PSB  
Kim O'Connell, SNJRS  
Stephen Cipot, SNJRS

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General Comments:

1. In general, EPA concurs with the findings and recommendations in the Free Product Remedial Strategy report and that lead contamination above 600 ppm, has been adequately delineated in the Nature and Extent of Lead in Soils, and with conclusion that the lead contamination is site related and not background or historical mining waste. In addition, the information contained in the Extent of Lead in Soils and Groundwater report presents a defensible remediation cleanup goal for remediating lead contamination above the 600 ppm from a human health perspective for an industrial/commercial, non-residential scenario, as outlined in the ROD. And toward this purpose, it appears that the extent and nature of lead at the site has now been adequately determined in the report. However, as you know, several recent telephone discussions have indicated that the PRP may no longer be considering the future use of the site to be industrial/commercial and non-residential, but rather some combination of mixed municipal usage, maybe involving a new municipal building, roadway and attendant parking lot, and might possibly also involve a play area or park. Therefore, page 30, which states "The LE Carpenter facility is an industrial site and will likely remain an industrial site in the future," no longer appears to be valid, and the data and calculations contained in the risk assessment therein, which refer to a lead cleanup level of 600 ppm, may not be a protective cleanup, considering these possible site uses. Therefore, the risk assessment needs to be revised to reflect any projected future uses of the site to be included in a Focused Feasibility Study (FFS), and should conform to RAGS guidance. The FFS should model specific proposed remedial options for projected risks associated with contamination present at the site and projected future site use.
2. The EPA has previously commented that potential ecological impacts must be addressed, and that an ecological risk assessment must be conducted for this site. Moreover, Comment 2 of the NJDEP's August 23, 2001, letter, similarly stated that as part of the FFS, an ecological risk assessment will also need to be performed. The most recent work plans had recommended and outlined that an ecological risk assessment was an objective (Nature and Extent of Lead in Soils and Groundwater, pg 7), but there was no further mention of it. This is based on results that indicated elevated lead concentrations have been detected in the drainage ditch adjacent to the site and the Rockaway River. The FFS must also address the unwanted and unpredicted migration of site lead and LNAPL contaminants, that might occur during design

and construction phases of work, as well as the possible compromise of any remedial cap technology that is being considered as part of the proposed remedial action, so as to be protective of human health and the environment. Since the site is in the flood plain of the Rockaway River, compromise could occur through normal flooding events. Additionally, a determination should be made as to whether the adjacent wetlands have been or will potentially be impacted. Since an ecological risk assessment was not included in this evaluation, it should be submitted separately or as part of the basis of the proposed FFS.

3. In the FFS, the preference for off-site disposal that is detailed in the current ROD must be shown to be outweighed by other factors in order to justify changing the selected remedy. The FFS should include detailed cost estimates for disposal, as well as capping and long term monitoring and maintenance of the site. In addition, it is anticipated that deed restrictions will be needed. These considerations must be sufficiently evaluated in the FFS. Further, note that if lead contaminated soils are left in place and capped, to ensure that the revised remedy remains protective, this remedial alternative will also require long term monitoring for lead in site groundwater, at appropriately selected sampling points, including between the Rockaway River and at an appropriately groundwater discharge point to the Rockaway River.
4. The Nature and Extent of Lead in Soils and Groundwater report proposes a change in remedy from excavation and off-site disposal of lead contaminated soils, to excavation, with some soils disposed of off-site and others replaced on-site, and capping the soils remaining on-site. Excavation is appropriate, especially in junction with addressing the free product issue, however, it is not clear that replacing and backfilling lead contaminated soils is the best remedy for the site, especially in light of the potential new uses. As mentioned above, this would have to be evaluated in the FFS.
5. In order to comply with federal wetlands ARARs, a wetlands assessment and restoration plan would be needed for any wetlands impacted or disturbed by contamination and/or remedial activities. Management practices outlined as per Federal Register, Volume 51, No. 219, Part 330.6, should be implemented. In addition, as sections of the site may fall within the 100-year and 500-year flood plain as determined by FEMA, the 100-year and 500-year flood plains must be determined, evaluated and assessed. Elevated water levels

from 100 and 500 year events may negatively impact the site. The unwanted and unpredicted migration of lead, LNAPL contaminants, or compromise of the remedial cap must be considered as part of any proposed remedial action, as mentioned above, so as to be protective of human health and the environment.

6. In addition, it should be noted that all soils and process wastes, including those which are currently suggested for off-site disposal need to be screened and removed based on sampling results. It is not sufficient to remove soils based solely on color, as suggested in the Nature and Extent of Lead in Soils and Groundwater Report.

## **SPECIFIC COMMENTS**

### **NATURE AND EXTENT OF LEAD IN SOILS AND GROUNDWATER**

1. Executive Summary - Based on the data presented and referenced in the report, it is unclear if an adequate aqueous and solid phase geochemistry characterization was conducted at the site. The groundwater sampling program included standard pH and Eh measurements but such measurements are often not sufficient and need to be interpreted within the context of additional geochemical and biochemical data. Typically, numerous aqueous and solid state redox measurement parameters must be known to assure that the lead contamination is non-mobile and poses no risk to groundwater and surface water. This data is needed to confirm if the negative synthetic precipitation leaching procedure (SPLP) test results and the detection of limited groundwater contamination are sufficient evidence of no significant leaching from the lead contaminated soils. This can be presented and evaluated in the FFS.

Any change in the following redox parameters in the soils and aquifer, such as Eh, dissolved oxygen, total dissolved carbon, speciation of iron sulfur or nitrogen, etc., could influence the potential concentrations and the migration of lead and LNAPLs into and within the groundwater. This data is necessary since the reactivity, solubility, and mobility of various lead compounds depend on redox conditions. Numerous metals, including lead, can potentially form ionic complexes and solid precipitates with redox sensitive elements. Organic contaminants in the groundwater are also influenced by redox conditions especially through the metabolic activity of microorganisms. Many of the detected chlorinated solvents including ethyl benzene and DEHP are more biodegradable under

reducing conditions. Therefore obtaining adequate site data on the redox processes is an important part of the FFS and risk assessment and for making a determination of a feasible remediation strategy.

2. More information is needed on the groundwater elevations within the entire impacted contaminated area and extending to the river. Watertable maps and a detailed horizontal, and vertical groundwater flow analysis of the upper impacted aquifer should be provided especially between the excavation areas and the river. It is unclear how much of the deeper lead contamination which extends down to 10 feet in depth, lays within the groundwater or surface aquifer (Nature and Extent of Lead in Soils and Groundwater, figure 2). The seasonally high watertable is relatively close to the ground surface and varies between 5 and 15 feet in depth across the site. Sporadic mounding of the groundwater, which occurs during seasonally high watertable levels, was detected east of building 14 near an area of deep lead contaminated soils (see report Section 3.5). The mounding was speculated to be induced by finer grained soils but is now currently absent because of this year's drought suppressed groundwater levels, ~~and may therefore~~.
3. The lead cleanup goal is described in the report as "risk-based" however, it is valid for risks associated with human risk, without any reference to an analysis of ecological risk. The remediation goal for lead (600 ppm) was calculated for an industrial/commercial, non-residential scenario, however this soil cleanup value is not necessarily designed to protect under other site uses or for ecological receptors. It has been informally proposed that the future use of the site could include a new municipal township building and possibly some sort of a park. Therefore, areas of lead soil contamination with less than 600 ppm may pose a threat to human or ecological receptors at the site. It is possible that either capping or removal of only those soils exceeding 600 ppm lead may not be protective; therefore, further justification needs to be provided in the FFS to formally address all potential projected future site uses.
4. For the ecological risk assessment, any contamination in the wetlands adjacent to and downstream of the site needs to be characterized. If this was conducted as part of a previous surface water and/or sediment study, the results should be summarized in the subject documents. The appropriate guidance that should be consulted covers a Screening-Level Ecological Risk Assessment (SLERA), as well as full blown Ecological Risk

Assessment, in accordance with current Superfund ecological risk assessment guidance (Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments [ERAGS], USEPA, 1997 [EPA/540-R-97-006]).

5. Results indicate that the process waste located within the two foot zone in test pit SS-17, tested hazardous for cadmium as well as lead. As this is a new source with which additional metals are possibly associated, the material needs to be sampled for a full metals suite for adequate characterization and disposition. Impacts to groundwater for cadmium and any other metals identified need to be considered. Post excavation sampling should include all other metals present at and above levels of concern. If historical groundwater results are available for cadmium (and any other metals identified), they should be reviewed and re-presented in the text within the context of the new information. If adequate groundwater samples do not exist, they will need to be collected, either as part of this evaluation, or separately, to serve as a basis of the FFS.
6. TCLP results need to be summarized in a table which shows the criteria against which the data are screened. A quick review of the results in the appendix shows that other contaminants were also detected and this data needs to be evaluated and discussed. A summary table would be most helpful to aid in this effort.
7. SPLP tests included results for copper. The results for copper as well as for any other metals run during SLPL testing should also be tabulated. In the area where copper was detected, samples for a full suite of metals should also be collected and analyzed. A clean up goal for copper should be established for the relevant area and analyses should be included in post excavation sampling. These items should be included in the FFS.
8. Field parameters collected during the groundwater sampling should be compiled and presented in a table.
9. Well WP-A2 was noted to be broken. A description of what is wrong with the well should be included and the well should either be rehabilitated or abandoned and properly sealed.
10. The sample identified as SS-47 was found to contain 25,056 mg/kg of copper. Some description of how and where this analysis was made needs to be clearly included and referenced in the text. If other parameters were run as part of this

analysis, that data should also be included. Note again that the area around this point appears to have been only visually delineated. Remedial action and post excavation sampling must target a specific concentration.

11. The sample identified as WDA-PES-6 appears to be a post excavation sample, indicating that lead contamination remains in this location. It should be included in the remedial action effort and FFS.
12. In discussing the lead isotope work, please expand the discussion of the 208/204 isotopic ratios. The text should present the values, as well as provide references and explanations of why the differences in the values are significant.
13. Page 7, Section 1.2 - One of the project objectives that is identified is to determine if any further ecological risk assessments are necessary. However, the four principle tasks that are included below the project objectives do not include any ecological assessments tasks. Additionally, there is neither a discussion of ecological assessment, nor any conclusions regarding ecological concerns. Although a soil cleanup criterion was calculated for human exposure, consideration of a soil cleanup criterion from a ecological perspective has not been presented. As runoff from the site into the Rockaway River may be a potential contaminant transport pathway, ecological concerns need to be addressed.
14. Page 10, Second full paragraph - It is indicated that the calibration consisted of performing an analysis on three standard samples. The high and medium lead standards are reported as approximately 5,600 ppm and 1,150 ppm, respectively, and the low lead standard is identified as being less than 20 ppm. The concentration of a standard is generally known as a specific value based on analysis of the standard, thus identifying it as a standard that can be used to reliably calibrate an instrument. Standard concentrations are not generally reported as approximately or less than. Please clarify.
15. Page 11, Section 2.2 Test Pit Excavation and Sampling Methodology - In the third paragraph it is reported that the intermediate sample was collected after the pit had been backfilled to a depth of 3 feet below ground surface. In the next paragraph (page 12) it is reported that samples were not composited, nor were samples collected in a manner that may mix distinct layers identified within the pit. These

statements appear to be contradictory as the method for excavating and backfilling was using a backhoe. Based on the photographs included in Appendix A, it appears as though the excavated soil was placed in a pile next to the pit and then the pile was placed back into the pit. This methodology would result in the backfilled material potentially consisting of mixed layers from a variety of depths. Therefore, the use of the intermittent samples to delineate the vertical distribution of lead is suspect.

16. Page 16, Section 3.1, bulleted section - In the second and third bullet remedial decisions regarding either on-site disposal or off-site disposal are presented using language, such as "will be". This document is to present information on the nature and extent of lead in the soils and groundwater at the site. A more detailed FFS report that discusses the potential remedial options based on the nine criteria presented in the NCP must be presented prior to making any remedial decisions. The discussion should be geared toward those specific criteria that are impacted and/or changed with respect to potentially changing of remedy. Please change the wording that indicates actions "will be" completed to "may be" or similar wording.

The fourth bullet discusses a previous sample collected during the investigation conducted by WESTON. The last sentence indicates that the inhalation and dermal pathways are not complete due to the depth being at 4.5-5.0 feet below ground surface. This statement may not be accurate depending on the receptor population and activity that is being evaluated, such as a construction worker digging on the site. Please remove this sentence.

17. Page 18, fourth paragraph - The purpose of this investigation was to determine the extent of lead contamination in the soil and groundwater, however during the investigation the process waste identified on the site was characterized as a hazardous material with respect to both lead and cadmium. Based on this designation, soil cleanup criterion will also need to be derived for cadmium. Groundwater data should also be re-examined to determine if the cadmium in the soil is a source of groundwater contamination.
18. Page 19, Section 3.3 - The leachability results for lead are listed in this section. Upon review of the data associated with the TCLP data for the characterization of the process waste, it appears that other inorganic compounds such as barium, cadmium, chromium, copper, nickle, silver and zinc



also had results that were above the detection limit for various sample media. These results should be discussed.

19. Page 19, Section 3.5 - To further evaluate the distinction between the two apparent sources of lead in the soil, a series of non-standard, but analytically sound procedures were used. Please reference these procedures.
20. Page 23, Galena is PbS and is a metallic sulfide mineral. Magnetite is an iron oxide, Fe<sub>3</sub>O<sub>4</sub>. "Dover County" should be Morris County (Dover District).
21. Page 24, Crystals of crocoite are often thin needles or prisms.
22. Page 25, Section 3.7.1 - It is reported that high xylene content was found in the areas that contain process waste material. As xylene is a solvent, the leachability of lead in the soil may be altered. Please discuss the potential impacts regarding xylene and the leachability of lead to groundwater in these areas.
23. Page 30, Section 4.2 - The last sentence of the first paragraph indicates that the industrial/commercial worker represents the most likely and conservative human receptor that would be exposed to the site. However, as mentioned in the general comments, the future site use may have changed, therefore, it is no longer necessarily the case that the industrial/commercial worker represents the most likely human receptor at the site. Nor is the industrial/commercial worker is not the most conservative human receptor that could be present at the site if site conditions were to change. Please clarify the planned potential future site uses and address accordingly.
24. Page 31, Section 4.3 - It is assumed that the 900 ppm is not presented to propose a new cleanup concentration. There are two references to standards in the concluding paragraph. One reference is to the soil lead standard dictated for the Wharton facility by the State of New Jersey. The second reference is to the blood lead standard set by the OSWER (USEPA 1994). These values are not promulgated cleanup standards. The soil lead value for the State of New Jersey is a criterion and the blood lead value in the TRW approach is a goal.
25. Page 32, Section 5 - Bullet number 7 indicates that the absence of lead in groundwater eliminates a groundwater

ingestion pathway from consideration from any risk assessment analyses. Please restate this conclusion to indicate that the groundwater pathway may only be eliminated for lead. Other site-related contaminants that exceed groundwater screening values are retained and considered chemicals of potential concern for the groundwater pathway.

26. Figure 2 - The wetlands associated with the Rockaway River and the Air Products drainage ditch should be identified on Figure 2.
27. Figure 2 - The former waste disposal area is delineated with a dashed gold line, however the legend does not contain a description of the what the dashed gold line represents (e.g., a general area, an delineated contaminant concentration). Please explain what this line delineates.
28. Figure 2 - Based on the distribution of samples it is not clear if the area delineated around SS-41B is a separate isolated area or if it is connected to the larger area around former building 14. There is evidence that the SS-42, SS-41C and SS-41A data provide a westerly boundary and that SS-37, SS-38, SS-39 and SS-40 data provide a easterly boundary, but there are no samples collected between SS-36 and SS-41B to delineate a southerly boundary. Please note this.
29. Figure 3 - As discussed in Comment 3, the use of the intermediate sample depths to delineate the vertical extent of contamination is suspect due to the intermediate samples being collected after the test pit was partially filled in with excavated soil.
30. Figure 3 - There are several problems with the legend on Figure 3. The lead concentrations and sample depths (in that order) are presented with each sample location, however the text in the legend is written with the sample depths and then lead concentrations, which does not match the order in which the data is presented. Additionally, the red coloring is identified as denoting areas that contain lead concentrations above 600 mg/kg, however the green coloring is not identified.

#### **FREE PRODUCT REMEDIATION STRATEGY**

1. The report indicates that the stumbling block for low temperature thermal desorption (LTTD) is that an air permit can not be obtained (figure 1), however it is not clear why this is

the case. While off-site disposal of free product is a potentially viable option, it is not clear from the text why it should be the preferred one. This type of evaluation is usually the subject of a Feasibility Study or FFS. It is impossible to evaluate the pros and cons of alternative approaches based on unsupported statements. This also holds for text which refers to costs and difficulty of alternatives without any indication as to what the remedial costs would be. ✓

2. In discussing soil handling, the document suggests that excavated materials greater than 3 inches in diameter could be replaced on site without washing. This is not clearly the case. If cobbles and boulders are coated with contaminants, they must be cleaned prior to replacing them. Handling of the wash water should be evaluated.
3. The proposed approach for the site remediation must be made clear. Specific criteria which will guide the limits of excavation must be stated. Firm, concise guidelines as to when it is appropriate to stop digging must be established. The limits shown on Figures 9 and 10 may differ from what is encountered in the field, and are based on a qualitative "probability" of contaminants being present. This is not sufficient to guide an actual remedial excavation strategy.
4. The excavation of Category D soils appears to include draining the product back into soils which have yet to be excavated. If the volume of draining product is high, booms may not be very effective at containing the flowing material. Methods of collecting the drained product need to be evaluated and discussed more fully.
5. Geological cross section A-A', Figures 4 and 5 - this cross section incompletely intersects the key site areas of interest and poorly illustrates the extent of the strata and the shallow aquifer under the site. The profile fails to clearly show how far the fill and debris layers, which contain the free product and lead contaminated soils, extend below the maximum Piezometric level or the seasonally high water table. It also appears that some of the deepest hot spots of lead contaminated soils are located off the A-A' axis of the geological cross section ( Nature and Extent of Lead in Soils and Groundwater, figure 2). Besides the surface soil test pit SS-16 several other soil borings including GPC-15A, GPB-2, GPB-10, and GPC-15-15, had lead concentrations (from a depth of 6 to 9 feet) which were many times above the soil screening criteria of 600 ppm. These borings were not illustrated on the geological cross section A-A' (figure 3. Nature and Extent of

Lead in Soils and Groundwater). There is also detailed information presented or discussed on the groundwater levels at these specific boring locations that can be represented to better effect on the figures.

For example, one additional cross section is needed that extends from some location north of point A to a location south of point A.' This additional cross section, if aligned to intersect some of the soil borings with deeper high lead detections and high and low water elevations and the prevailing groundwater flow direction (see comment 5 above), would better illustrate the heterogeneity in the debris, fill and sandy and silty gravel layers and the potential variations in the groundwater levels across the site.